

ABSTRACT

An Investigation of Tornado and Thunderstorm Deaths in Florida

(Oral Presentation)

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The author has been studying Florida tornadoes, particularly tornado outbreaks, for many years. Various papers identifying the primary synoptic patterns associated with Florida tornado outbreaks, the characteristics of their environment, and detailed climatological studies have been published since 1989. Nevertheless, results remain difficult to apply in real time and using the mean condition approach has lead to false alarms. Many outbreaks studied consisted of weak tornadoes that were truly of little consequence, while a few outbreaks caused most of the deaths and injuries. The next task identified was to study those tornado outbreaks that were truly significant in the sense that the tornadoes were unusually strong (F2 to F4, there has never been an F5 in Florida and only 2 F4's) or deaths occurred. However, the first focus of this ongoing investigation would be on what the actual circumstances were that resulted in fatalities from tornadoes and thunderstorms. In other words, rather than crunching the F-scale numbers in the database to identify significant events, knowing going in that there are problems and biases with the tornado database, we would first go back and look at what actually happened to the people involved. The goal was to first gather information to be used for preparedness and mitigation purposes and then find relevance to meteorological parameters. Interestingly, it turned out the former was much easier than the later, but it is the later, the search for the magic parameter that is so often focused on in operations research.

Tornado deaths from 1882 to 1996 and thunderstorm deaths from 1959 to 1996 were investigated. A brief synopsis of a few results: no fatality has ever occurred inside a structure from a severe thunderstorm - all occurred outdoors and most deaths occurred in capsized small boats, less common where people killed in cars blown off bridges or people blown off trucks, and rotten trees and limbs falling on people outdoors or on cars. In contrast, most of the tornado fatalities occurred when people were inside structures. Mobile home deaths predominate after the late 1960's when such homes became common. Young children and the elderly were most likely to be killed by tornadoes. It was extremely rare for a fatality to result from severe damage to a well-built structure and these are the cases that merit further study. It would appear most tornadoes in Florida would be survivable if residents, especially high-risk residents such as children and the elderly sought shelter, even in mobile homes. There were two cases of fatalities resulting from people abandoning mobile homes. The results show that while it may take considerable time to pursue the meteorological issues associated with more accurately predicting tornadoes and tornado strength, making the forecaster keenly aware of how people get hurt can result in better products and advice today.